

CLAIMS:

1. A skin antiseptic composition dispenser comprising:
a container defining an interior volume;
5 skin antiseptic composition located within the interior volume of the container;
a spout attached to the container, wherein the spout comprises at least one
opening therein;
a dispensing seal located between the interior volume of the container and the
spout; and
10 a foam pad located over the spout, wherein the foam pad comprises hydrophilic
foam with an apparent surface energy of 35 dynes per centimeter or more.
2. A dispenser according to claim 1, wherein the hydrophilic foam has an apparent
surface energy of 40 dynes per centimeter or more.
15
3. A dispenser according to claim 1, wherein the hydrophilic foam has an apparent
surface energy of 45 dynes per centimeter or more.
4. A dispenser according to claim 1, wherein the skin antiseptic composition
20 comprises an agent selected from the group consisting of iodine, an iodine complex,
chlorhexidine, and combinations thereof.
5. A dispenser according to claim 1, wherein the skin antiseptic composition has a
surface tension of 50 dynes per centimeter or less.
25
6. A dispenser according to claim 1, wherein the skin antiseptic composition has a
surface tension of 45 dynes per centimeter or less.
7. A dispenser according to claim 1, wherein the skin antiseptic composition has a
30 surface tension of 40 dynes per centimeter or less.

8. A dispenser according to claim 1, wherein the container is impermeable to liquid and vapor phases of the skin antiseptic composition and wherein the container exhibits permeability to gaseous ethylene oxide of 20 mg/hr/cm^2 or less.
- 5 9. A dispenser according to claim 1, wherein the container comprises a tubular shape that comprises one or more flexible walls free of metallic foil layers.
- 10 10. A dispenser according to claim 9, wherein the one or more flexible walls free of metallic foil layers comprise an inner layer facing the interior volume and an outer layer facing away from the interior volume, and wherein at least one of the inner layer and the outer layer is impermeable to liquid and vapor phases of the skin antiseptic composition; and further wherein at least one of the inner layer and the outer layer exhibits permeability to gaseous ethylene oxide of 20 mg/hr/cm^2 or less.
- 15 11. A dispenser according to claim 10, wherein the outer layer comprises polyester.
- 20 12. A dispenser according to claim 10, wherein the inner layer is selected from the group consisting of a layer of polyolefin, a layer of halogenated polyolefin, and a layer of perfluororadical-containing thermoplastic.
- 25 13. A dispenser according to claim 1, wherein the container comprises an elongated tubular shape defining a longitudinal axis, and wherein the foam pad comprises at least one major surface, and wherein the at least one major surface is located in a plane that is not parallel to the longitudinal axis, and further wherein the longitudinal axis does not intersect the at least one major surface.
- 30 14. A dispenser according to claim 1, wherein the container comprises an elongated tubular shape defining a longitudinal axis, and wherein the foam pad comprises two opposing major surfaces, and wherein each major surface defines a plane that is not parallel to the longitudinal axis, and further wherein the longitudinal axis does not intersect at least one of the two opposing major surfaces.

15. A dispenser according to claim 14, wherein the longitudinal axis does not intersect either of the two opposing major surfaces.

5 16. A dispenser according to claim 1, wherein the dispensing seal comprises a seal layer attached over a dispensing orifice in the container.

10 17. A dispenser according to claim 1, wherein the spout comprises a barb and wherein rotation of the spout relative to the container advances the barb to pierce the dispensing seal.

18. A dispenser according to claim 1, wherein the container comprises a vent opening into the interior volume of the container, wherein the vent is located remote from the foam pad.

15 19. A dispenser according to claim 18, wherein the vent comprises a vent orifice and a vent seal closing the vent orifice.

20 20. A dispenser according to claim 19, wherein the vent seal comprises a seal layer attached to the container over the vent orifice.

21. A dispenser according to claim 19, wherein the vent seal comprises a barb, wherein rotation of the vent seal and the container relative to each other advances the barb to pierce the vent seal.

25 22. A dispenser according to claim 1, further comprising a liquid impermeable sleeve sized to contain the foam pad, wherein the foam pad is located within the sleeve.

30 23. A dispenser according to claim 22, wherein the sleeve comprises a sleeve volume of 200% or more of a volume of the skin antiseptic composition in the container.

24. A skin antiseptic composition dispenser comprising:
a container defining an interior volume, wherein the container comprises a
tubular shape that comprises one or more polymeric walls free of metallic foil layers;
skin antiseptic composition located within the interior volume of the container;
5 and
dispensing means for dispensing the skin antiseptic composition;
wherein the container is impermeable to liquid and vapor phases of the skin
antiseptic composition and wherein the container exhibits permeability to gaseous
ethylene oxide of 20 mg/hr/cm² or less.

10

25. A dispenser according to claim 24, wherein the skin antiseptic composition
comprises an agent selected from the group consisting of iodine, an iodine complex,
chlorhexidine, and combinations thereof.

15

26. A dispenser according to claim 24, wherein the one or more flexible walls free
of metallic foil layers comprise an inner layer facing the interior volume and an outer
layer facing away from the interior volume, and wherein at least one of the inner layer
and the outer layer is impermeable to liquid and vapor phases of the skin antiseptic
composition; and further wherein at least one of the inner layer and the outer layer
20 exhibits permeability to gaseous ethylene oxide of 20 mg/hr/cm² or less.

20

27. A dispenser according to claim 26, wherein the outer layer comprises polyester.

25

28. A dispenser according to claim 26, wherein the inner layer is selected from the
group consisting of a layer of polyolefin, a layer of halogenated polyolefin, and a layer
of perfluororadical-containing thermoplastic.

30

29. A dispenser according to claim 24, further comprising a dispensing seal
comprising a seal layer attached over a dispensing orifice in the container.

30. A dispenser according to claim 29, wherein the container comprises a vent
opening into the interior volume of the container, wherein the vent is located remote
from the dispensing orifice.

31. A dispenser according to claim 30, wherein the vent comprises a vent orifice and a vent seal closing the vent orifice.

5 32. A skin antiseptic composition dispenser comprising:
a container defining an interior volume, wherein the container comprises a cylinder that comprises one or more polymeric walls free of metallic foil layers;
skin antiseptic composition located within the interior volume of the container;
and
10 dispensing means for dispensing the skin antiseptic composition;
wherein the container is impermeable to liquid and vapor phases of the skin antiseptic composition; and wherein the one or more polymeric walls free of metallic foil layers comprises an inner layer and an outer layer, wherein at least one of the inner layer and the outer layer is substantially impermeable to ethylene oxide.

15 33. A dispenser according to claim 32, wherein the skin antiseptic composition comprises an agent selected from the group consisting of iodine, an iodine complex, chlorhexidine, and combinations thereof.

20 34. A dispenser according to claim 32, wherein the outer layer comprises polyester.

35. A dispenser according to claim 32, wherein the inner layer comprises a layer selected from the group consisting of a layer of polyolefin, a layer of halogenated polyolefin, a ceramic layer, and a layer of perfluororadical-containing thermoplastic
25 polyolefin.

36. A dispenser according to claim 32, further comprising a dispensing seal comprising a seal layer attached over a dispensing orifice in the container.

30 37. A dispenser according to claim 36, wherein the container comprises a vent opening into the interior volume of the container, wherein the vent is located remote from the dispensing orifice.

38. A dispenser according to claim 37, wherein the vent comprises a vent orifice and a vent seal closing the vent orifice.

5 39. A dispenser according to claim 38, wherein the vent seal comprises a seal layer attached to the container over the vent orifice.

40. A skin antiseptic composition dispenser comprising:
a container defining an interior volume, wherein the container comprises a first end distal from a second end along a longitudinal axis;
10 skin antiseptic composition located within the interior volume of the container;
at least one dispensing opening proximate the first end of the container;
a dispensing seal closing the at least one dispensing opening;
at least one vent orifice proximate the second end of the container;
a vent seal closing the at least one vent orifice; and
15 an applicator attached to the first end of the container, wherein the at least one dispensing opening is in fluid communication with the applicator when the dispensing seal is opened;
wherein the skin antiseptic composition enters the applicator through the dispensing opening under the force of gravity when the dispensing seal and the vent
20 seal are opened and the at least one vent orifice is located above the at least one dispensing opening.

41. A dispenser according to claim 40, further comprising first rotating means for opening the dispensing seal and second rotating means for opening the vent seal.

25

42. A dispenser according to claim 41, wherein the first rotating means and the second rotating means rotate in opposite directions about the longitudinal axis of the container to open the dispensing seal and the vent seal.

30 43. A dispenser according to claim 40, wherein the vent seal comprises an opening tab.

44. A dispenser according to claim 40, wherein the applicator comprises a hydrophilic foam pad with an apparent surface energy of 35 dynes per centimeter or more.

5 45. A dispenser according to claim 44, wherein the hydrophilic foam has an apparent surface energy of 40 dynes per centimeter or more.

46. A dispenser according to claim 44, wherein the hydrophilic foam has an apparent surface energy of 45 dynes per centimeter or more.

10

47. A method of preparing a skin antiseptic composition dispenser for use, the method comprising:

providing a skin antiseptic composition dispenser according to claim 40;

15 opening the dispensing seal, wherein the at least one dispensing opening is in fluid communication with the applicator;

opening the vent seal, wherein the vent orifice is open; and

orienting the container such that the vent orifice is located above the dispensing opening, whereby the skin antiseptic composition flows into the applicator.

20 48. A method according to claim 47, wherein opening the dispensing seal comprises rotating the applicator about the longitudinal axis of the container.

25 49. A method according to claim 47, wherein the dispenser comprises a vent cover over the vent seal, and wherein opening the vent seal comprises rotating the vent cover about the longitudinal axis of the container.

30 50. A method according to claim 47, wherein opening the dispensing seal comprises rotating the applicator in a first direction about the longitudinal axis of the container; and wherein the dispenser comprises a vent cover over the vent seal, and further wherein opening the vent seal comprises rotating the vent cover in a second direction about the longitudinal axis of the container, and still further wherein the first direction is opposite from the second direction.

51. A method according to claim 47, wherein opening the vent seal comprises removing the vent seal from the container.

52. A method according to claim 47, wherein the vent seal comprises a tab, and wherein opening the vent seal comprises peeling the vent seal from the container such that the vent orifice is open.

53. A method according to claim 47, wherein opening the dispensing seal comprises perforating the dispensing seal.

54. A method according to claim 47, wherein opening the vent seal comprises perforating the vent seal.

55. A method of preparing a skin antiseptic composition dispenser for use, the method comprising:

providing a skin antiseptic composition dispenser comprising a container defining an interior volume, skin antiseptic composition located within the interior volume of the container, an applicator attached to the container, and a liquid impermeable sleeve, wherein the applicator is located within the liquid impermeable sleeve;

moving the skin antiseptic composition from the container into the applicator, wherein the skin antiseptic composition not retained by the applicator is retained within the liquid impermeable sleeve; and

removing the applicator from the liquid impermeable sleeve after moving the skin antiseptic composition from the container into the applicator.

56. A method according to claim 55, further comprising compressing the liquid impermeable sleeve and the applicator located therein after moving the skin antiseptic composition from the container into the applicator.

57. A method according to claim 55, wherein the applicator comprises a foam pad comprising hydrophilic foam with an apparent surface energy of 35 dynes per centimeter or more.

58. A skin antiseptic composition dispenser comprising:
a container defining an interior volume, wherein the container comprises one or
more polymeric walls free of metallic foil layers;
5 skin antiseptic composition located within the interior volume of the container;
and
dispensing means for dispensing the skin antiseptic composition;
wherein the container is impermeable to liquid and vapor phases of the skin
antiseptic composition; and wherein the container further comprises at least one layer
10 that is substantially impermeable to ethylene oxide.
59. A dispenser according to claim 58, wherein the outer layer covers less than
100% of one or more of the walls.
- 15 60. A dispenser according to claim 66, wherein the outer layer covers at least 60%
of one or more of the walls.
61. A dispenser according to claim 58, wherein the skin antiseptic composition
comprises an agent selected from the group consisting of iodine, an iodine complex,
20 chlorhexidine, triclosan, octenidine and combinations thereof.
62. A dispenser according to claim 58, wherein the layer that is substantially
impermeable to ethylene oxide comprises polyester.
- 25 63. A dispenser according to claim 58, wherein the one or more walls comprise a
layer selected from the group consisting of a layer of polyolefin, a layer of halogenated
polyolefin, and a layer of perfluororadical-containing thermoplastic polyolefin.
64. A dispenser according to claim 58, further comprising a dispensing seal
30 comprising a seal layer attached over a dispensing orifice in the container.

65. A dispenser according to claim 64, wherein the container comprises a vent opening into the interior volume of the container, wherein the vent is located remote from the dispensing orifice.
- 5 66. A dispenser according to claim 65, wherein the vent comprises a vent orifice and a vent seal closing the vent orifice.
67. A dispenser according to claim 66, wherein the vent seal comprises a seal layer attached to the container over the vent orifice.
- 10 68. A dispenser according to claim 58 wherein the one or more walls free of metallic foil layers are flexible.
69. A dispenser according to claim 58 wherein the container is cylindrical.
- 15 70. A dispenser according to claim 58 wherein the layer that is substantially impermeable to ethylene oxide is a barrier layer adhered to at least a portion of the exterior of the container.
- 20 71. A dispenser according to claim 70 wherein the barrier layer is adhered using a pressure sensitive adhesive, heat activated adhesive, or hot melt adhesive.
72. A dispenser according to claim 70 wherein the barrier layer comprises a layer selected from the group consisting of a layer of polyolefin, a layer of halogenated polyolefin, a ceramic layer, and a layer of perfluororadical-containing thermoplastic polyolefin.
- 25 73. A skin antiseptic composition dispenser comprising:
a container defining an interior volume, wherein the container comprises one or
30 more polymeric walls and a barrier layer adhered to at least a portion of the exterior of the wall,
skin antiseptic composition located within the interior volume of the container;
and

dispensing means for dispensing the skin antiseptic composition;
wherein the container is impermeable to liquid and vapor phases of the skin
antiseptic composition; and wherein the container is substantially impermeable to
ethylene oxide.

5

74. The dispenser of claim 73, wherein the barrier layer is substantially
impermeable to ethylene oxide.

10

75. The dispenser of Claim 74 wherein the barrier layer comprises a layer selected
from the group consisting of a layer of polyolefin, a layer of halogenated polyolefin, a
ceramic layer, aluminum foil, and a layer of perfluororadical-containing thermoplastic
polyolefin.